

MACHINE DESIGN

1981 EDITORIAL INDEX

Volume 53—January to December
AUTHOR INDEX

A

- Adams, Henry and James F. McElwee—"Powder metal parts boost limit-switch versatility," Oct. 8, p. 136
Allen, Charles R.—"Acid digester breaks down low-level nuclear waste," July 9, p. 130
Arnonson, Robert B.—"A second chance for blimps," Mar. 26, p. 25
"THE ENGINEERING MODEL: For scaled-down problem solving," Oct. 22, p. 60
"Cockpit of the future," Dec. 10, p. 31

B

- Badawy, M. K.—"How to succeed as a manager: Part 1—The manager's role," Mar. 26, p. 76
"How to succeed as a manager: Part 2—The causes and prevention of failure," Apr. 9, p. 217
"How to succeed as a manager: Part 3—Why the switch from engineer to manager is difficult," May 7, p. 91
"How to succeed as a manager: Part 4—Taking charge of your career," May 21, p. 59
"How to succeed as a manager: Part 5—Easing the transition to management," June 11, p. 89
"How to succeed as a manager: Part 6—Should you get an M.B.A. degree?" June 25, p. 59
"How to succeed as a manager: Part 7—Where the technical supervisor fits in," July 23, p. 63
"How to succeed as a manager: Part 8—The uses of organization," Aug. 6, p. 117
"How to succeed as a manager: Part 9—Organizing the technical operation," Sept. 10, p. 95
"How to succeed as a manager: Part 10—Planning: the path to better results," Sept. 24, p. 63
"How to succeed as a manager: Part 11—The art of decision-making," Oct. 8, p. 111
"How to succeed as a manager: Part 12—Controls for technical operations," Oct. 22, p. 69
"How to succeed as a manager: Part 13—Evaluating technical performance," Nov. 12, p. 79
"How to use time more effectively," Dec. 10, p. 178
Bailey, Bruce M.—"Calc program finds gas pressure drop," Jan. 8, p. 162
Bailey, J. K., Jr. and A. T. Galbato—"Evaluating bearings for high-speed operation," Oct. 8, p. 141
Barbarin, Robert H. and Richard G. Ramsdell—"Accounting for seal swell," July 9, p. 170
Barton, Lyndon O.—"Simplifying velocity analysis for mechanisms," June 11, p. 123
Batson, J. D.—"Shifting rollers keep steel strip flat," Jan. 8, p. 130
Beercheck, Richard C.—"Detroit engineers a COMEBACK—Silicone under the brake pedal," Jan. 8, p. 100
"Controlling hydraulics with electronics," Jan. 22, p. 57
NEW BUSINESS MACHINES: Printing on the fly," Feb. 12, p. 72
"Hydraulic manifolds," Apr. 23, p. 73
"Long life for hydraulic systems," July 23, p. 89
Behrens, Jack F.—"Coatings that take a beating," Aug. 20, p. 71
Berninger, John F.—"Air-valve subbase eliminates costly repping," Sept. 24, p. 99
Bhaduri, S.—"Thermal stresses in spherical shells," Oct. 22, p. 111
Birrell, N. D.—"Flexible legs secure deep-sea oil rig," Mar. 26, p. 90
Bittar, Joseph—"Electronic controls cut elevator travel time and operating cost," Apr. 9, p. 204
Blackburne, E. F.—"Super M60 tank made from conversion kit," Nov. 26, p. 78
Blauth, Robert E. and Edward J. Preston—"Computing the payback for CAD," Aug. 20, p. 91
Boe, W. A.—"Flat dredge head cuts cleaner channels," Aug. 20, p. 86

C

- Boyd, Richard—"Controlling the cost of rubber parts," May 21, p. 100
Bradus, Bob and Dave Saar—"Microcomputer controls handyman's drill press," Feb. 12, p. 86
Cameron, Don—"Around the world in 20 days is balloon designer's goal," July 23, p. 70
Campbell, Roger—"Designing wire-cloth parts," Aug. 6, p. 133
Caplan, Stanley H.—"Applying human factors in design," Apr. 9, p. 243
Carlisle, Ben H.—"Detroit engineers a COMEBACK—Waiting for better EV batteries," Jan. 8, p. 99
NEW BUSINESS MACHINES: Using motors effectively," Feb. 12, p. 73
Carson, Dwight D.—"Improving reliability for industrial computers," June 25, p. 112
Carlson, John R.—"Thermistors for overcurrent protection," Dec. 10, p. 161
Carter, W. Merle—"Simplifying gear backlash calculations," Apr. 9, p. 235
Chitayat, Anwar and John Goodlet—"Air bearings and granite blocks provide precise positioning," Mar. 12, p. 100
Clemmer, Duane T.—"Trade-offs in selecting ceramic capacitors," Apr. 9, p. 189
Coates, Robert D.—"New role for digital multimeters," June 11, p. 105
"Simple thermocouple sensing," Aug. 20, p. 110
Cokoris, T. James—"Minicomputers tackle CAD/CAM," Jan. 8, p. 121
Colman, Benjamin W.—"Negotiating an invention agreement," Apr. 23, p. 86
"Encouraging invention," June 25, p. 111
Comella, Thomas M.—"The image makers: How the latest in photo-reproduction can simplify your paperwork," Nov. 26, p. 69
Conover, Charles E.—"Spliced O-rings for large static seals," Nov. 12, p. 132
Cox, John L. and Delmar W. Karger—"Marketing as a design partner," Apr. 23, p. 51
Curry, David T.—"Improved galvanized steels," Nov. 26, p. 82
Curry, David T. and Donald R. Dreger—"Detroit engineers a COMEBACK—The synergistic bumper," Jan. 8, p. 95

D

- Dale, Peter C.—"Oscilloscopes that remember," Nov. 12, p. 89
Dann, Richard T.—"Machine tools on the move," Mar. 12, p. 68
CONSTRUCTION EQUIPMENT: New push for productivity," May 7, p. 66
RECREATION EQUIPMENT: Tryout for new technology," June 11, p. 76
"Shuttle opens door to profits in space," July 9, p. 100
HOME APPLIANCES: Serving the fast-food generation," Aug. 6, p. 84
AGRICULTURAL EQUIPMENT: The race for innovation," Sept. 10, p. 82
"Engineering better health," Oct. 8, p. 100
"DEFENSE R&D: Faster spinoff for industry," Dec. 10, p. 98
Davis, S. Bear—"Ceramic boiler" will utilize solar power," Sept. 10, p. 104
Dieckmann, Robert—"Calculating sheet-metal allowances," Feb. 26, p. 121
Dogotch, Ron and John Lenning—"Mobile-crane sheds 70,000 lb," May 7, p. 106
Donald, Eric P.—"A practical guide to bolt analysis," Apr. 9, p. 225

E

- Doughty, Samuel—"Calculating properties for solids of revolution," Dec. 10, p. 184
Drago, Raymond J.—"Minimizing noise in transmissions," Jan. 8, p. 143
Dreger, Donald R. and David T. Curry—"Detroit engineers a COMEBACK—The synergistic bumper," Jan. 8, p. 95
Dreger, Donald R.—"The promise of cryogenic processing," Jan. 22, p. 73
NEW BUSINESS MACHINES: Coping with electrical noise," Feb. 12, p. 74
"A plastic molding process for 'impossible' parts," Apr. 9, p. 183
"Close-tolerance, no-flash forgings," May 7, p. 99
"Healing defects by HIP," May 21, p. 79
"Metallurgy on the move," June 25, p. 67
"Plastics for harsh environments," Nov. 12, p. 106
"Ion beam improves adhesive bonds," Nov. 12, p. 136
Durelli, A. J. and K. Rajiah—"Minimizing stress with photoelasticity," Dec. 10, p. 125

F

- Eikelberger, Rand J.—"Selecting the right keyboard," Nov. 12, p. 68
Elms, Duane—"Replacing cams with software," Feb. 26, p. 95
Enochson, Loren—"Desktop instruments for modal analysis," May 7, p. 81
Erdman, Robert—"Accurate ways to measure low currents," Jan. 8, p. 153
Erickson, Wally—"New standards for power-transmission belts," Jan. 22, p. 83
Facey, Terry—"Space telescope will see farther with precision mirror," Nov. 26, p. 80
Farrell, James J. and Jerry Michal—"Single-chip computers for machine control," Oct. 8, p. 167
Feeley, John E.—"Economic approach to O-ring seal design," Dec. 10, p. 169
Felstein, Milton—"Plotting part intersections," Jan. 8, p. 164
Finn, Lyle—"Under-sea guy lines steady offshore oil platform," May 21, p. 72
Foundryer, Charles M.—"Buying a turnkey CAD/CAM system," Oct. 22, p. 77
Fox, Jon—"Button redesign cuts computer-keyboard complexity," Dec. 10, p. 140
Fuller, Don—"Streamlining your workload," Jan. 8, p. 105

G

- Galbato, A. T. and J. K. Bailey, Jr.—"Evaluating bearings for high-speed operation," Oct. 8, p. 141
George, Richard F.—"Specifying bearings for low speed," July 9, p. 121
Goodlet, John and Anwar Chitayat—"Air bearings and granite blocks provide precise positioning," Mar. 12, p. 100
Gougeon, Jan—"Wood looks good in wind-turbine blade application," Aug. 20, p. 84
Graham, Robert G.—"Turbine air motors shed their high-cost image," Nov. 26, p. 93
Grantham, John P.—"High technology comes to injection molding," Feb. 26, p. 103
Griesel, Charles—"Math models for hydrostatic transmissions," May 7, p. 119
Gross, T. A. O.—"Fail-safe switching with triacs," July 23, p. 103
Gross, T. A. O. and Richard R. Sedlack—"Low-cost loss-of-phase protection," Feb. 12, p. 124

1981 ANNUAL INDEX

- Gurley, Steve—"Realistic guidelines for flexible circuits," Aug. 6, p. 125
Gutman, Nathan—"How to keep product costs in line," Jan. 22, p. 50

H

- Hadley, Lester J.—"New chips that simplify motor control," Feb. 12, p. 109
Hauri, Gil—"Solid-state control simplifies wheel-chair operation," Nov. 12, p. 100
Heilman, Paul M.—"Thumbnail guide to nonferrous metalworking," July 23, p. 77
Hollister, Don—"Piston flow dividers," Mar. 26, p. 69
Hertz, Daniel L., Jr.—"The hidden cause of seal failure," Apr. 9, p. 209
Hoyer, Philip L.—"MOSFETs vs bipolar for power transistors," Oct. 22, p. 103
Hoyer-Ellefson, Dr. Sigurd—"Ultrasonic signals replace typewriter's mechanical linkages," Mar. 26, p. 92
Huff, Wayne—"Ducted-fan trainer duplicates jet's behavior," Feb. 12, p. 88
Husjak, Edward J.—"Graphite-composite beam will self-deploy in space," Apr. 23, p. 68

J

- Jamison, Warren E.—"Lubricating with oil-filled 'plastic sponges,'" Sept. 24, p. 108
Johnson, Harold R. III—"Interference fits for mechanical drives," May 21, p. 89
Joishi, Mohan N.—"Developing a plan for metric conversion," Oct. 22, p. 116

K

- Kahn, David—"Protecting relay contacts," Dec. 10, p. 176
Kaplan, Ron and George Lynch—"Low-inertia plotter has microcomputer control," Jan. 8, p. 128
Karger, Delmar W. and John L. Cox—"Marketing as a design partner," Apr. 23, p. 51
Keiser, John—"Bottoming cycle cuts diesel engine's fuel cost," July 23, p. 79
Kendler, James—"Holographic scanner identifies product and price," Feb. 26, p. 90
Kerman, R. H. and Dale F. Wilcox—"Conserving silver in electrical contacts," June 11, p. 133
Kessler, Dr. Larry and Dr. Donald Yuhas—"Acoustic microscope finds structural flaws," Apr. 9, p. 206
Kleiner, Maj. Eric—"Heads-up display gives better view with holographic lenses," Nov. 12, p. 98
Knight, G. L. B. and R. Jay Smith—"Designing prismatic pressure vessels," Nov. 26, p. 103
Kostach, Philip—"Connecting power supplies in parallel," Sept. 10, p. 139
Kozman, Ted A.—"Massive magnet draws fusion power closer," Sept. 10, p. 106
Krolak, Ron—"Offset drive simplifies dozer maintenance," June 25, p. 78
Krouse, John K.—"Detroit engineers a COMEBACK—Driving a geometric model," Jan. 8, p. 90
"NEW BUSINESS MACHINES: Designing for speed and accuracy," Feb. 12, p. 72
"Fighting corrosion in fasteners," Feb. 26, p. 71
"Sculptured surfaces for CAD/CAM," Mar. 12, p. 115
"Computer time-sharing for CAD/CAM," Apr. 23, p. 57
"Automated drafting: The first step to CAD/CAM," May 21, p. 50
"Smart robots for CAD/CAM," June 25, p. 85
"Graphic terminals for CAD/CAM," Aug. 6, p. 95
"WC programming: The link between CAD and CAM," Sept. 10, p. 111
"Software for structural analysis," Oct. 8, p. 151
"Automated Factories: The ultimate union of CAD and CAM," Nov. 26, p. 84
Kruklik, T. G.—"A road map for stress analysis," Aug. 6, p. 138
Kumar, Shashi—"Limit switches you can program," July 9, p. 135

L

- Laing, Virgil L.—"Speeding up transducer output calculations," Nov. 26, p. 106
Landon, Robert G.—"Metro bus design goes back to basics," Dec. 10, p. 142
Langen, Ron and Edgar Strauss—"Check-out station has built-in bag maker," Aug. 6, p. 110
Larson, Steven and Roger Miller—"Filtration: How much is enough?" Oct. 8, p. 161
Leftault, Charles J., Jr.—"Reversed vending machine encourages aluminum conservation," July 9, p. 128
Lenning, John and Ron Dogatch—"Mobile crane sheds 70,000 lb.," May 7, p. 106

- Lewart, Cass R. and Daniel S. Lewart—"Calc program assembles machine code," Mar. 12, p. 135
Lindem, Tom—"Electronic controls mean smaller, more precise transfer machine," Aug. 6, p. 112
Logan, Andrew—"Chopper design is simpler with tail rotor gone," Sept. 24, p. 82
Logan, Terrance G.—"Estimating the cost of uncertainty," Sept. 24, p. 106
Love, S. F.—"Speeding up an engineering project," Jan. 22, p. 104
Lynch, George and Ron Kaplan—"Low-inertia plotter has microcomputer control," Jan. 8, p. 128

M

- Maass, Donald W.—"More torque per horsepower," Apr. 9, p. 236
Mack, Robert A.—"Super magnets replace bearings in satellite gyro," Oct. 22, p. 86
MacKenzie, Bruce A.—"Cutting costs with pre-finished steel bar," Mar. 26, p. 83
"Tips for specifying cold-drawn steel shapes," Apr. 23, p. 84
"Focus on forging," Sept. 10, p. 131
Mansperger, J. Robert—"Locating intermediate shafts for gear drives," Aug. 20, p. 106
Martin, E. Joel—"Constant velocity PTO drives," Feb. 12, p. 101
"Overload protection for PTO drives," Sept. 10, p. 119
McElwee, James F. and Henry Adams—"Powder-metal parts boost limit-switch versatility," Oct. 8, p. 136
McLean, Murray G.—"Flexible pumps for problem fluids," Mar. 12, p. 125
McNulty, T. and J. Yellin—"Applying zero-voltage switches," Oct. 8, p. 184
Meeco, Wayne—"Ultrasonic air with oil-less compressor," July 9, p. 145
Mennisoff, Peter G.—"Understanding solid-state timers," June 11, p. 139
Michal, Jerry and James J. Farrell—"Single-chip computers for machine control," Oct. 8, p. 167
Mihachuk, William—"Zinc-alloy bearings challenge the bronzes," Dec. 10, p. 133
Mikkelsen, Daniel C. and Keith Sievers—"High-speed turboprop will be a fuel miser," June 11, p. 100
Miller, Roger and Steven Larson—"Filtration: How much is enough?" Oct. 8, p. 161
Mollick, John—"Rocket launcher delivers low-cost payload," Sept. 24, p. 84
Morgan, Ray—"Solar cells power fair-weather aircraft," May 7, p. 104
Mullen, Jim—"Pulse-combustion gas furnace promises impressive energy savings," Jan. 22, p. 66
Munman, Fernando—"Tough blowout preventers protect deep oil wells," Jan. 22, p. 68
Murphy, Russell—"Saving energy with synthetic lubricants," June 11, p. 142
Murray, Bruce D.—"Selecting structural adhesives," May 21, p. 67

N

- Nguyen, Tuan C.—"Sizing the gap in snap rings," Aug. 6, p. 146
Nicholas, John C.—"Stabilized bearings with finite-element analysis," July 9, p. 169

O

- O'Brien, Bob—"Thinner is better for aluminum-can design," Oct. 8, p. 134
Orthwein, William C.—"Adding ribs for maximum strength," Feb. 26, p. 113
"Simplified power-screw design," Aug. 20, p. 79
Otsuka, William M.—"Avoiding LED failures," Oct. 8, p. 129

P

- Peekema, Tom—"Printer 'writes' with electrostatic dots," Mar. 12, p. 102
Pizzirano, Joseph—"The acoustics of plastic foam," Jan. 8, p. 135
Pokvitis, David Z.—"Electropolishing goes functional," Sept. 24, p. 56
Preston, Edward J. and Robert E. Blauth—"Computing the payback for CAD," Aug. 20, p. 91

R

- Rajalah, K. and A. J. Durelli—"Minimizing stress with photoelasticity," Dec. 10, p. 125
Ramadell, Richard G. and Robert H. Barbarin—"Accounting for seal swell," July 9, p. 170
Rasmussen, David E. and Ronald R. Koser—"Blade winder requires 5-axis computer control," Oct. 22, p. 88

- Raudsepp, Eugene—"Maximizing your potential for creativity-Part 1," Feb. 12, p. 93
"Maximizing your potential for creativity-Part 2," Feb. 26, p. 61
Raudsepp, Eugene and Joseph C. Yeager—"Salvaging the sub-par performer," Dec. 10, p. 117
Raymond, Robert E.—"Flow resistance in hydraulic circuits," Aug. 20, p. 99
Reynolds, Walter—"Liquid ohms simplify gas-flow calculations," Oct. 8, p. 178
Rieger, Neville F. and Jeffrey M. Steele—"The basics of finite-element modeling," Apr. 9, p. 165
"Basic course in finite-element analysis: Basic concepts," June 25, p. 103
"Basic course in finite-element analysis: Modeling," July 9, p. 153
"Basic course in finite-element analysis: Advanced technology," July 23, p. 97
Roberts, Charles Jr. and Howard Schwerdlin—"Combating heat in U-joints," July 23, p. 83
Roser, Ronald R. and David E. Rasmussen—"Blade winder requires 5-axis computer control," Oct. 22, p. 88
Romer, Ronald A.—"Controlling motion with PCs," June 25, p. 95
Rzepecki, Raymond M.—"Static protection for electronic components," Mar. 26, p. 97

S

- Saar, Dave and Bob Bradus—"Microcomputer controls handyman's drill press," Feb. 12, p. 86
Schalla, Clarence A.—"Making accurate vacuum readings," Feb. 26, p. 122
Schmidt, J. F.—"Socket screws that don't meet specs," Oct. 8, p. 121
Schubert, Frank—"Calculating flat pattern shapes," May 7, p. 130
"Quick way to shape flat patterns," Oct. 8, p. 183
Schwerdlin, Howard and Charles Roberts, Jr.—"Combating heat in U-joints," July 23, p. 83
Schwickert, James A.—"Pneumatic valve is key to missile-flight control," June 25, p. 80
Sedlack, Richard R. and T. A. O. Gross—"Low-cost low-of-phase processor," Feb. 12, p. 124
Seilly, Alec—"Wrap-around design boosts solenoid performance," June 11, p. 98
Semin, Roy—"The efficiency of belt drives," Apr. 9, p. 197
Seneczko, Myron—"Detroit engineers a COMEBACK—Two paths for power," Jan. 8, p. 97
"Improved brakes and clutches," Mar. 26, p. 105
"Controlling speed with mechanical CVTs," Sept. 24, p. 89
Sharpsteen, James T.—"Photo chemical machining of gears," Mar. 12, p. 107
Shenk, Edwin K.—"Substituting electronics for gears," Apr. 9, p. 178
Sherman, John H.—"Preventing captive screw damage," Mar. 12, p. 132
Sievers, Keith and Daniel C. Mikkelsen—"High-speed turboprop will be a fuel miser," June 11, p. 100
Somers, Chris—"A new way to capture elusive signals," May 7, p. 111
Smith, R. Jay and G. L. B. Knight—"Designing prismatic pressure vessels," Nov. 26, p. 103
Southworth, John S.—"Mechanism analysis on a desktop computer," Apr. 23, p. 79
Speck, James—"Tightening threaded fasteners," Apr. 9, p. 240
Spencer, Dr. William J.—"Artificial pancreas delivers insulin on command," Apr. 23, p. 70
Steele, Jeffrey M. and Neville F. Rieger—"The basics of finite-element modeling," Apr. 9, p. 165
"Basic course in finite-element analysis: Basic concepts," June 25, p. 103
"Basic course in finite-element analysis: Modeling," July 9, p. 153
"Basic course in finite-element analysis: Advanced technology," July 23, p. 97
Strasser, Federico—"Low-cost joining with rivets," Jan. 22, p. 103
"Increasing pocket-calc accuracy," Mar. 26, p. 112
"Assembling with wedges," July 23, p. 104
"Strengthening soldered connections," Sept. 10, p. 148
"Spacing of metal stampings," Oct. 22, p. 118
Strauss, Edgar and Ron Langen—"Check-out station has built-in bag maker," Aug. 6, p. 110
Sullivan, James A.—"Troubleshooting hydraulic systems," May 21, p. 96
Sutherland, J. Paul—"Laser replaces rotating mass in new gyro system," May 21, p. 74
Swain, Daniel—"Understanding plasma-sprayed coatings," Mar. 12, p. 91

T

- Teschler, Leland E.—"Detroit engineers a COMEBACK—Bits and bytes beneath the hood," Jan. 8, p. 92
"Ultraminiature mechanics," Jan. 8, p. 112
"NEW BUSINESS MACHINES: Finding new ways to communicate," Feb. 12, p. 66
"Differences shrink between computers and PCs," June 11, p. 113

"Remote I/O for industrial control," July 9, p. 161
 "New technology for flat displays," July 23, p. 52
 "Update on electronic logic," Aug. 20, p. 63
 "Bigger niche for small batteries," Sept. 24, p. 71
 "How good is Soviet robot technology," Oct. 8, p. 43
 "Promising future for 'offbeat' circuit boards," Dec. 10, p. 151
 Theberge, John E. and Mark Wolverton—"Wear behavior of plastics on plastics," Feb. 12, p. 79
 Turner, Timothy E.—"Forecasting IC Failures," Nov. 26, p. 85
 Tustin, Wayne—"Shake-tests for electronic assemblies," Jan. 22, p. 93

U

Ullman, Albert W.—"Beryllium-copper springs," Oct. 22, p. 93

V

Van Koningsveld, Charles—"Getting power to the pump," Feb. 12, p. 117

W

Welling, Conrad G.—"Deep-sea sited mines and processes metallic nodules," Feb. 26, p. 88
 Whitley, James H.—"Designing tin-plated contacts," May 7, p. 128
 Willcox, Dale F. and R. H. Kerman—"Conserving silver in electrical contacts," June 11, p. 133
 Wise, Clare E.—"Technology for sale: Screening the buyers," Mar. 26, p. 60
 "MX gains momentum," Apr. 9, p. 38
 "Indy on a shoestring," May 7, p. 26
 "Automakers accelerate turbo testing," June 25, p. 50
 "GM unveils new front-drive A-cars," Dec. 10, p. 23
 Wolansky, E. B.—"Stresses in grooved shafts," Sept. 10, p. 146
 Wolverton, Mark and John E. Theberge—"Wear behavior of plastics on plastics," Feb. 12, p. 79
 Woodring, Richard H.—"Miniature directional-control valves," Nov. 13, p. 117

Y

Yeager, Joseph C. and Eugene Raudsepp—"Salvaging the sub-par performer," Dec. 10, p. 117

Z

Zimmerman, Mark D.—"Salary prospects bright for engineers," Jan. 8, p. 25
 "Rekindling an interest in wood," Jan. 22, p. 44
 "The synfuel solution," Feb. 26, p. 62
 "Whistle-blowing: The perils of professional dissent," Mar. 12, p. 63
 "Food production: Going for a low-energy diet," Apr. 23, p. 44
 "Student boom causes mixed reactions," May 21, p. 20
 "Controlling engineer supply," June 11, p. 29
 "Enlarging the engineer's outlook," July 9, p. 113
 "Breaking the \$35k barrier," Aug. 20, p. 56

SUBJECT INDEX



1 ELECTRICAL AND ELECTRONIC

SUBJECT CLASSIFICATION KEY

- A —Article
 DIA —Designers In Action
 E&E —Electrical & Electronics
 Ref. Issue
 F&J —Fastening & Joining
 Ref. Issue
 FP —Fluid Power Ref. Issue
 M —Materials Ref. Issue
 MD —Mechanical Drives Ref.
 Issue
 N/T —News Trends
 S —Scanning

11. Motors & Electromechanical Actuators

Motors, E&E, 5/14, p. 15
 Short poles stop stepper oscillation, S, 7/9, p. 51
 Wrap-around design boosts solenoid performance, DIA, 6/11, p. 98

12. Motor Controls & Protectors

Machine tools on the move: Drives get smarter, more versatile, A, 3/12, p. 74
 Artificial pancreas delivers insulin on command, DIA, 4/23, p. 70
 Motor controls and protectors, E&E, 5/14, p. 95
 Solid-state control simplifies wheel-chair operation, DIA, 11/12, p. 100

13. Switches & Relays

Switches and relays, E&E, 5/14, p. 171
 Potted switch survives seawater, S, 1/8, p. 48
 Membrane switches can be stacked, S, 12/10, p. 58
 Limit switches you can program, A, 7/9, p. 135
 Powder-metal parts boost limit-switch versatility, DIA, 10/8, p. 136
 Protecting relay contacts, A, 12/10, p. 176
 Hinged keyboard accommodates liquid-crystal display, S, 8/29, p. 46
 Rubber pad forms telephone keyboard, S, 8/20, p. 51
 Keyboards printed on rolls, S, 10/8, p. 68
 Selecting the right keyboard, A, 11/12, p. 68
 Button redesign cuts computer-keyboard complexity, DIA, 12/10, p. 140

14. Circuit Components

Solid-state switching devices, E&E, 5/14, p. 249
 Update on electronic logic, A, 8/20, p. 63
 Air pressure actuates potentiometer wiper, S, 1/22, p. 32
 Compact capacitor heats itself, S, 4/9, p. 78
 Trade-offs in selecting ceramic capacitors, A, 4/9, p. 189
 Fail-safe switching with triacs, A, 7/23, p. 103
 Applying zero-voltage switches, A, 10/8, p. 184
 MOSFETs vs. bipolar for power transistors, A, 10/22, p. 103
 Ultraminiature mechanics, A, 1/8, p. 112
 Replacing cams with software, A, 2/26, p. 95
 U.S., Japan vie for semiconductor title, N/T, 4/23, p. 21
 Japan won't catch U.S. in computers, N/T, 5/7, p. 10
 Electronics in the news: Switching-chip, E&E, 5/14, p. 6
 RECREATION EQUIPMENT: Toys that talk, A, 6/11, p. 77
 Electronic controls mean smaller, more precise transfer machine, DIA, 8/6, p. 112
 Reliability data confirm tape-bond decision, N/T, 8/20, p. 10
 Single-chip computers for machine control, A, 10/8, p. 167
 Plated-wire memories for industrial control, A, 11/12, p. 125
 Forecasting IC failures, A, 11/26, p. 85
 New chips that simplify motor control, A, 2/12, p. 109
 Variable-bandwidth filter cuts audio noise, S, 6/25, p. 37
 Laser replaces rotating mass in new gyro system, DIA, 5/21, p. 74

Lasers and particle beams as weapons, N/T, 7/9, p. 8
 Laser annealing: a technique leading to new materials, N/T, 7/23, p. 8
 Laser trains tank crews, S, 7/23, p. 42
 Laser beam reflections monitor wind-tunnel tests, N/T, 8/6, p. 29
 Laser maps turbine flow, S, 10/8, p. 64
 Data-display panel for your next car?, N/T, 3/26, p. 4
 Indicators and displays, E&E, 5/14, p. 295
 Electrolytic display depends on chemical reaction, S, 7/9, p. 44
 New technology for flat displays, A, 7/23, p. 52
 Avoiding LED failures, A, 10/8, p. 129
 Display system for pilots fits on eyeglasses, N/T, 11/12, p. 26
 Color enhances liquid-crystal displays, S, 11/26, p. 44

15, 16. Miscellaneous Components, Interconnections

Rare-earth magnets power artificial-heart device, N/T, 6/11, p. 18
 Massive magnet draws fusion power closer, DIA, 9/10, p. 106
 Super magnets replace bearings in satellite 'gyro,' DIA, 10/22, p. 88
 High-energy magnets have structural integrity, S, 12/10, p. 60
 The \$12 light bulb is on the way, A, 2/12, p. 23
 Plastic base cools industrial lamp, S, 9/10, p. 52
 Expanding cartridge improves heat transfer, S, 3/26, p. 42
 Low-cost loss-of-phase protection, A, 2/12, p. 124
 Fuseholder installs with a snap, S, 3/12, p. 48
 Signal distortion eliminated in optical fibers, N/T, 1/22, p. 8
 Gas-filled films form acoustic lens, S, 3/26, p. 42
 Hybrid tap couples coax to fiber optics, S, 4/9, p. 74
 Fiber optics may provide better missile guidance, N/T, 5/7, p. 4
 Apertures and stops suppress instrument noise, S, 5/21, p. 42
 Price barrier broken for fiber-optic emitters and detectors, N/T, 7/9, p. 18
 Optical cable improves satellite reception, S, 7/23, p. 48
 Stacked prisms generate diverging light beams, S, 8/6, p. 51
 Stepped motor balances beam-splitter output, S, 11/12, p. 62

1981 ANNUAL INDEX

Fiber optics monitor volatile fluids, S, 11/26, p. 44
Interconnections, E&E, 5/14, p. 329
Prese-in PC terminal eliminates solder contamination, S, 9/24, p. 48
Elastomeric connector relies on pressure, S, 1/8, p. 48
Filtered connector defeats interference, S, 2/26, p. 44
Modular connector simplifies circuit modifications, S, 4/23, p. 38
Designing tin-plated contacts, A, 5/7, p. 128
Electronics in the news: Connector specification finalized, E&E, 5/14, p. 8
Conserving silver in electrical contacts, A, 6/11, p. 133
Pneumatic coupler makes fast PC connections, S, 7/23, p. 46
Snap-in socket speeds lighting installation, S, 11/12, p. 54
Crimp connector withstands the weather, S, 12/10, p. 62
Interlocking fingers form flexible duct, S, 1/8, p. 44
Double-wall cable stops surgical-pen shorts, S, 6/11, p. 54
Realistic guidelines for flexible circuits, A, 8/6, p. 125
Promising future for 'offbeat' circuit boards, A, 12/10, p. 151
Plastic cards speed microbial analysis, S, 10/22, p. 42

17. Control Systems & Computers

Machine and process control systems, E&E, 5/14, p. 127
Simple tracker aims solar collectors, S, 3/26, p. 44
Substituting electronics for gears, A, 4/9, p. 175
Input pulses power electronic totalizer, S, 6/11, p. 52
Understanding solid-state timers, A, 6/11, p. 139
Microcomputer controls handyman's drill press, DIA, 2/12, p. 86
Prototype programmer provides painless control, S, 3/12, p. 46
Machine tools on the move: Controls that cut downtime, A, 3/12, p. 73
NC machine tools building the Navy's models, N/T, 4/9, p. 4
Electronic controls cut elevator travel time and operating cost, DIA, 4/9, p. 204
Electronics in the news: Speech-recognition programs, E&E, 5/14, p. 13
Differences shrink between computers and PCs, A, 6/11, p. 113
Controlling motion with PCs, A, 6/25, p. 95
Improving reliability for industrial computers, A, 6/25, p. 112
VLSI chosen for new CNC, N/T, 7/23, p. 18
Engineering better health, A, 10/8, p. 100
Blade winder requires 5-axis computer control, DIA, 10/22, p. 88
Calc program assembles machine code, A, 3/12, p. 135
Increasing pocket-calc accuracy, A, 3/26, p. 112

Mechanism analysis on a desktop computer, A, 4/23, p. 79
Desktop instruments for modal analysis, A, 5/7, p. 81
Electronics in the news: New desktop computer features color graphics, E&E, 5/14, p. 2
Electronics in the news: Experimental Josephson computer due in 1986, E&E, 5/14, p. 3
Desktop computers designed for fast CAD, N/T, 6/11, p. 8
Low-inertia plotter has microcomputer control, DIA, 1/8, p. 125
NEW BUSINESS MACHINES: Fast, smart, and talkative, A, 2/12, p. 66
Wristwatch computer monitors jogger's pulse, N/T, 2/26, p. 12
Printer 'writes' with electrostatic dots, DIA, 3/12, p. 102
Ultrasonic signals replace typewriter's mechanical linkages, DIA, 3/26, p. 92
Remote I/O for industrial control, A, 7/9, p. 161
Heads-up display gives better view with holographic lenses, DIA, 11/12, p. 98
Optical memory stores data on film, S, 12/10, p. 86
Minicomputers tackle CAD/CAM, A, 1/8, p. 121
Sculptured surfaces for CAD/CAM, A, 3/12, p. 115
The basics of finite-element modeling, A, 4/9, p. 165
Computer time-sharing for CAD/CAM, A, 4/23, p. 57
Automated drafting: The first step to CAD/CAM, A, 5/21, p. 50
Smart robots for CAD/CAM, A, 6/25, p. 85
Committee glimpses CAD/CAM of future, N/T, 8/6, p. 18
Graphic terminals for CAD/CAM, A, 8/6, p. 95
Computing the payback for CAD, A, 8/20, p. 91
NC programming: The link between CAD and CAM, S, 9/10, p. 111
Engineering better health: Engineering human repairs, A, 10/8, p. 106
Buying a turnkey CAD/CAM system, A, 10/22, p. 77
AUTOMATED FACTORIES: The ultimate union of CAD and CAM, A, 11/26, p. 54
New software shortens design time, N/T, 6/25, p. 12
Software for structural analysis, A, 10/8, p. 151
Computer program reasons like a human, N/T, 12/10, p. 2

18. Power Supplies, Conditioners & Controls

Power supplies, E&E, 5/14, p. 311
Redox is ready, A, 2/26, p. 25
Bigger niche for small batteries, A, 9/24, p. 71
Plastic battery 5 to 10 years away, N/T, 1/12, p. 8
Thin-film solar cells: How long will they last?, N/T, 3/26, p. 12
Solar cells power fair-weather aircraft, DIA, 5/7, p. 104
Bulb-mounted cell soaks up sunlight, S, 6/11, p. 52
Solar cells sense cloud cover, S, 8/20, p. 48

Milestone reached in commercial MHD-generator development, N/T, 11/26, p. 4
Connecting power supplies in parallel, A, 9/10, p. 139
Rotary transformer depends on enclosed air gap, S, 10/22, p. 44

19. Instrumentation

Engineering better health: Tracking patient condition, A, 10/8, p. 103
Accurate ways to measure low currents, A, 1/8, p. 153
Photoacoustic system analyzes diesel exhaust, S, 1/22, p. 35
Piston detector mounts on cylinder end cup, S, 1/22, p. 36
Tiny sensor detects direction of tilt, S, 1/22, p. 36
Lumpy sphere reveals slip direction and rate, S, 2/26, p. 48
Holographic scanner identifies product and price, DIA, 2/26, p. 90
Stick a thermometer to your product?, N/T, 4/23, p. 10
Concentric tubes monitor cryogen level, S, 5/7, p. 52
Transducers, E&E, 5/14, p. 269
Ultrasonic thermometer measures high temperatures, S, 5/21, p. 38
Sponge probe pinpoints pinholes, S, 6/25, p. 40
Liquid crystals generate low-cost heat-transfer maps, N/T, 7/9, p. 27
Dual pickups sense coupling wear, S, 7/9, p. 46
Laser sight aims hand-held thermometer, S, 8/6, p. 52
Involute transducer inspects pipeline welds, S, 8/6, p. 56
Rotating sensor detects dry materials, S, 8/20, p. 49
Simple thermocouple sensing, A, 8/20, p. 110
RF detector senses generator condition, S, 10/8, p. 69
Second steering wheel senses torque, S, 10/8, p. 70
Speeding up transducer output calculations, A, 11/26, p. 106
Thermistors for overcurrent protection, A, 12/10, p. 161
Electronic map shows pilot what's below, N/T, 3/12, p. 8
Greater, safer mobility for the blind, N/T, 3/12, p. 8
Acoustic microscope finds structural flaws, DIA, 4/9, p. 206
A new way to capture elusive signals, A, 5/7, p. 111
RECREATION EQUIPMENT: More entertainment in smaller packages, A, 6/11, p. 80
New instrument does work of five, N/T, 9/24, p. 10
Electronic pendulum simplifies aircraft navigation, S, 11/12, p. 50
Oculoscopes that remember, A, 11/12, p. 89
New role for digital multimeters, A, 6/11, p. 105
Mini meter mounts in pushbutton cutouts, S, 10/8, p. 67
Treasure finder' pinpoints deeply buried wastes, N/T, 2/26, p. 20



2 FLUID POWER

21, 22, 23. Fluids, Fluid Conditioners, Fluid Conductors

Fluid power for fixing people, N/T, 5/21, p. 8
Machine tools on the move: Water-based productivity, A, 3/12, p. 76
Fluids, FP, 9/17, p. 125
More machine tools use water-based fluids, FP, 9/17, p. 2
Reservoirs, FP, 9/17, p. 30
Designing prismatic pressure vessels, A, 11/26, p. 103
Hydraulic and pneumatic filters, FP, 9/17, p. 139
Filtration: How much is enough?, A, 10/8, p. 161
Pneumatic lubricators, FP, 9/17, p. 144
Heat exchangers, FP, 9/17, p. 147
Cryo radiator for satellite checked out in space chamber, N/T, 3/26, p. 10
Air dryers, FP, 9/17, p. 142
Straight-thread ports made easier to obtain, N/T, 12/10, p. 16

Pipe and tubing, FP, 9/17, p. 128
Hydraulic hose, FP, 9/17, p. 132
Self-locking fittings need no O-rings, S, 7/23, p. 44
Tube fittings, FP, 9/17, p. 129
Hose fittings, FP, 9/17, p. 133
Push-in fitting seals pneumatic tubing, S, 10/22, p. 48
Tubing joined without solder or tools, FP, 9/17, p. 6
Quick-disconnect couplings, FP, 9/17, p. 134
Captive staple speeds hose installation, S, 9/24, p. 46
Ball-and-socket joint breaks apart, S, 10/22, p. 46
Metal tubes joined without solder or tools, F&J, 11/19, p. 6
Simple coupling handles heat and pressure, S, 12/10, p. 62

24. Linear Devices

Floating end caps regulate cylinder stroke, S, 1/8, p. 44

Mushroom cylinders regulate rolling freight cars, S, 3/12, p. 44
Steel stampings form lightweight cylinder, S, 3/12, p. 48
Fast-return cylinder controls itself, S, 8/20, p. 44
Floating piston isolates pressure gages, S, 9/10, p. 48
Cylinders, FP, 9/17, p. 184
Accumulators, FP, 9/17, p. 26
Intensifiers, FP, 9/17, p. 22

25. Rotary Devices

Ground-source heat pump for residential heating and cooling?, N/T, 2/12, p. 10
Getting power to the pump, A, 2/12, p. 117
Flexible pumps for problem fluids, A, 3/12, p. 125
Living with head 'droop' in centrifugal pumps, A, 8/6, p. 108
Hydraulic pumps, FP, 9/17, p. 17
Positive-displacement pumps, FP, 9/17, p. 290

Fluid motors, FP, 9/17, p. 179
 Turbine air motors shed their high-cost image, A, 11/26, p. 33
 Ultraclean air with oil-less compressors, A, 7/9, p. 145
 Compressors, FP, 9/17, p. 41
 Vacuum pumps, FP, 9/17, p. 43
 Pump cartridge speeds maintenance, S, 11/26, p. 42
 Rotary actuators, FP, 9/17, p. 193

26. Seals

Seals, MD, 6/18, p. 229
 The hidden cause of seal failure, A, 4/9, p. 209
 Resilient seal needs no springs, S, 5/7, p. 52
 Accounting for seal swell, A, 7/9, p. 170
 O-rings and other squeeze packings, FP, 9/17, p. 225
 Split-ring seals, FP, 9/17, p. 230
 Pressure-energized seals, FP, 9/17, p. 233
 Splined O-rings for large static seals, A, 11/12, p. 132
 Economical approach to O-ring seal design, A, 12/10, p. 169
 Face seals, FP, 9/17, p. 233
 Built metal forms high-temperature gaskets, S, 8/6, p. 48
 Exclusion seals, FP, 9/17, p. 235
 Compression packings and seals, FP, 9/17, p. 227

27. Valves

Tough blowout preventers protect deep oil wells, DIA, 1/22, p. 68
 System safety, FP, 9/17, p. 289
 Reed valve regulates one-way heat pipe, S, 10/8, p. 67
 Close-coupled exhaust speeds cylinder response, S, 1/8, p. 46
 Direction-control valves, FP, 9/17, p. 68
 Putting valves in circuits, FP, 9/17, p. 77
 Air-valve subbase eliminates costly repiping, A, 9/24, p. 99
 Miniature directional-control valves, A, 11/12, p. 117
 Piston flow dividers, A, 3/26, p. 69
 Internal valve stops tank-car spills, S, 5/21, p. 40
 Hydraulic pressure and flow valves, FP, 9/17, p. 70
 Fluid-handling valves, FP, 9/17, p. 236
 Double-duty valve cuts energy consumption, S, 2/12, p. 46
 Servovalves, FP, 9/17, p. 74
 Hydraulic manifolds, A, 4/23, p. 73
 Manifolds, FP, 9/17, p. 136

28. Instruments & Controls

Making accurate vacuum readings, A, 2/26, p. 122

Check-ball beer meter draws a draft, S, 7/9, p. 48
 Gages and meters, FP, 9/17, p. 78
 Reciprocating head monitors suspended solids, S, 5/21, p. 40
 Pneumatic pressure regulators, FP, 9/17, p. 77
 Moving-part logic, FP, 9/17, p. 306
 Fluidics, FP, 9/17, p. 308
 Spinning cone sterilizes fluids, S, 5/21, p. 42

29. Systems & Assemblies

Flow resistance in hydraulic circuits, A, 8/20, p. 99
 CONSTRUCTION EQUIPMENT: Smart hydraulics, A, 5/7, p. 69
 Troubleshooting hydraulic systems, A, 5/21, p. 96
 Long life for hydraulic systems, A, 7/23, p. 89
 Mobile 'test stand' proves hydraulic system, FP, 9/17, p. 4
 Controlling hydraulics with electronics, A, 1/22, p. 57
 Math models for hydrostatic transmissions, A, 5/7, p. 119
 Smart hydraulics for off-road vehicles, FP, 9/17, p. 3
 Hydrostatic drives, FP, 9/17, p. 181
 Power units, FP, 9/17, p. 30
 Pneumatic derailleur shifts for itself, S, 11/26, p. 40



3 MECHANICAL

31. Power Sources

Acids digest radioactive wastes, N/T, 4/9, p. 8
 Study group predicts fairly bright energy future, N/T, 4/9, p. 16
 Buildings waste half their energy, N/T, 4/23, p. 8
 Food Production: Going for a low-energy diet, A, 4/23, p. 44
 Engines, MD, 6/18, p. 64
 Spacious foam domes are energy misers, N/T, 8/6, p. 12
 New improvements slated for aerial refueling system, N/T, 1/8, p. 16
 High-speed turboprop will be a fuel miser, DIA, 6/11, p. 100
 Cool-running blades to convert turbine for synfuels, N/T, 8/6, p. 4
 Engine sets record for wind-tunnel test hours, N/T, 10/22, p. 4
 See-through engine runs without oil, S, 4/23, p. 36
 'Salted' diesel produces no particulates, N/T, 5/7, p. 18
 CONSTRUCTION EQUIPMENT: Engines on a diet, A, 5/7, p. 67
 Jury still out on health effects of diesels, MD, 6/18, p. 4
 Automakers accelerate turbo testing, A, 6/25, p. 50
 Coming: propane as a common truck fuel?, N/T, 7/9, p. 20
 Bottoming cycle cuts diesel engine's fuel cost, DIA, 7/23, p. 72
 Industrial engine maker enters automotive repower market, N/T, 9/10, p. 4
 Oldsmobile unveils V6 diesel for front and rear-drive models, A, 9/10, p. 29
 IC engine looks good on paper as energy system for the home, N/T, 11/12, p. 12
 Tighter NO_x control for heavy vehicles may not be possible by 1986, N/T, 12/10, p. 4
 Energy Dept. giving mixed signals on fusion, N/T, 4/23, p. 4
 Finest detail yet on pictures made with heavy ions, N/T, 8/11, p. 10
 Acid digester breaks down low-level nuclear waste, DIA, 7/9, p. 130
 Geothermal boreholes make drilling history, N/T, 10/22, p. 8
 Air Force fires new rocket motor, N/T, 2/12, p. 10
 The synfuel solution, A, 2/26, p. 82
 New technique shows how coal behaves, N/T, 4/9, p. 10
 Alcohol fuel from discarded newspapers?, N/T, 10/22, p. 18

200-ft turbine blades mounted on rail cars, N/T, 2/12, p. 4
 Open-cycle plant to tap seawater for electricity, N/T, 2/26, p. 12
 Wind farm to go on-line in mid-1981, N/T, 3/12, p. 4
 Turning to the wind, A, 4/9, p. 156
 Ceramic 'boiler' will utilize solar power, DIA, 9/10, p. 104
 Solar One readied for 'fire-up,' N/T, 10/8, p. 4
 'Plug-in' solar water heater, N/T, 10/8, p. 18
 Ways to reduce wood-stove emissions, N/T, 8/6, p. 18

32, 33, 34. Drives, Transmissions, Drive Components

Truck transmissions redesigned for the long haul, MD, 6/18, p. 2
 Chains and chain drives, MD, 6/18, p. 22
 The efficiency of belt drives, A, 4/9, p. 197
 Belt drive cuts motorcycle noise and maintenance, MD, 6/18, p. 3
 Belts and belt drives, MD, 6/18, p. 28
 Minimizing noise in transmissions, A, 1/8, p. 143
 Gears and gear drives, MD, 6/18, p. 13
 Cable drive is precise, S, 11/26, p. 42
 Production hardware ready for fighting vehicles, N/T, 3/26, p. 8
 More torque per horsepower, A, 4/9, p. 236
 Adjustable-speed drives, MD, 6/18, p. 7
 Controlling speed with mechanical CVTs, A, 9/24, p. 89
 Offset drive simplifies dozer maintenance, DIA, 6/25, p. 78
 Overload protection for PTO drives, A, 9/10, p. 119
 New standards for power-transmission belts, A, 1/22, p. 83
 Belt transmits power in small racer, N/T, 10/22, p. 10
 Simplifying gear backlash calculations, A, 4/9, p. 235

35. Rotational Components

Bearings, MD, 6/18, p. 137
 Evaluating bearings for high-speed operation, A, 10/8, p. 141
 Specifying bearings for low speed, A, 7/9, p. 121
 Life insurance for filament-wound bearings, A, 2/12, p. 122

Machine tools on the move: Spindles that levitate, A, 3/12, p. 71
 Zinc-alloy bearings challenge the bronzes, A, 12/10, p. 133
 Constant velocity PTO drives, A, 2/12, p. 101
 Rubber rollers drive lube-free coupling, S, 2/26, p. 46
 Stiff joints speed universal installation, S, 2/26, p. 48
 Couplings, MD, 6/18, p. 48
 Universal joints, MD, 6/18, p. 53
 Interlocking wedges form simple joint, S, 7/9, p. 48
 Combating heat in U-joints, A, 7/23, p. 63
 U-joint resists wear, S, 10/22, p. 44
 Silicone fluid transfers torque, S, 5/7, p. 54
 CONSTRUCTION EQUIPMENT: New axle technology, A, 5/7, p. 71
 Locating intermediate shafts for gear drives, A, 8/20, p. 106
 Stresses in grooved shafts, A, 9/10, p. 146
 Quick-mount clutch slips along shafts, S, 2/26, p. 46
 Improved brakes and clutches, A, 3/26, p. 105
 Clutches and brakes, MD, 6/18, p. 34
 Dual brakes depend on opposing cylinders, S, 9/10, p. 51
 Flywheel inertia changes with load, S, 1/8, p. 43
 Interference fits for mechanical drives, A, 5/21, p. 89

36, 37. Mechanisms, Controls

Positive action powers mechanical hand, S, 2/12, p. 40

38. Subsystems

Air bearings and granite blocks provide precise positioning, DIA, 3/12, p. 100
 Air-cushion, ground-effect undercarriages researched at new facility, N/T, 1/22, p. 4
 Compact suspension relies on crank arm, S, 9/10, p. 47
 By 1986, an all-photosynthetic home?, N/T, 10/8, p. 10
 Automatic oiler keeps chain drives running, S, 11/12, p. 52
 Robot uses vision efficiently, N/T, 3/12, p. 12
 How good is Soviet robot technology?, A, 10/8, p. 43
 Robotic assembly cell to start building aircraft, N/T, 11/12, p. 4



4 ASSEMBLY COMPONENTS

41, 42, 43. Fasteners, Springs & Isolation Devices, Misc.

Fighting corrosion in fasteners, A, 2/26, p. 71
 Self-sealing fasteners, F&J, 11/19, p. 107
 Nuts and inserts, F&J, 11/19, p. 23
 Pins, F&J, 11/19, p. 90
 Quick-operating fasteners, F&J, 11/19, p. 108
 Retaining rings, F&J, 11/19, p. 77
 Low-cost joining with rivets, A, 1/22, p. 103
 Rivets, F&J, 11/19, p. 81
 Preventing captive screw damage, A, 3/12, p. 132

Do-it-yourself bolts, S, 3/26, p. 40
 Oval-headed screw prevents tampering, S, 7/23, p. 46
 Simplified power-screw design, A, 8/20, p. 79
 Socket screws that don't meet specs, A, 10/8, p. 121
 Threaded fasteners, F&J, 11/19, p. 9
 Welded fasteners, F&J, 11/19, p. 38
 Washers, F&J, 11/19, p. 88
 Simple clamps speed pipeline assembly, S, 4/23, p. 40
 Assembling with wedges, A, 7/23, p. 104
 Stamped spring-steel fasteners, F&J, 11/19, p. 114
 Formed metal fasteners, F&J, 11/19, p. 120
 Sizing the gap in snap rings, A, 8/6, p. 146
 Beryllium-copper springs, A, 10/22, p. 93
 Shock absorbers, FP, 9/17, p. 197

Hammer handle soaks up shock, S, 9/24, p. 48
 Composite flywheels spun to destruction, N/T, 8/6, p. 8
 Plastic plug refines gravity irrigation, S, 10/22, p. 48
 Rubber blade reduces lawnmower injuries, S, 12/10, p. 54

44. Measurement Equipment

Quick test reveals properties of composite materials, N/T, 6/25, p. 10
 Notches strip shows fatigue damage, S, 8/6, p. 46



5 MATERIALS

51, 52. Metals

Metallurgy on the move, A, 6/25, p. 67
 Materials, F&J, 11/19, p. 68
 Ferrous metals, M, 3/19, p. 9
 New alloys for surfacing critical parts, N/T, 10/8, p. 12
 Improved galvanized steels, A, 11/26, p. 62
 ASM foresees innovations in 1981, N/T, 1/8, p. 10
 Nonferrous metals, M, 3/19, p. 67
 Thinner is better for aluminum-can design, DIA, 10/8, p. 134
 Ultraclean titanium power produced, N/T, 5/7, p. 10

Plastic film boosts speaker performance, S, 9/24, p. 46
 Elastomers, rubbers, M, 3/19, p. 225
 'Wood' from soft-drink bottles, N/T, 2/26, p. 10
 New urethane chosen for helmet padding, N/T, 3/26, p. 16
 CONSTRUCTION EQUIPMENT: Rubber vs steel, A, 5/7, p. 72
 Silicone mold simplifies crack detection, S, 10/8, p. 70
 Inexpensive thermoplastic elastomer to compete with vulcanized rubbers, N/T, 11/12, p. 10
 Water-based silicone alkyds offer high performance, low pollution, N/T, 11/26, p. 10
 Plants flourish in soil-free controlled environment, N/T, 6/25, p. 18

6/11, p. 82
 The acoustics of plastic foam, A, 1/8, p. 135
 Waste sludges used to make better insulating bricks, N/T, 6/11, p. 12
 Tubular plywood tackles tough applications, S, 8/20, p. 51
 Wood looks good in wind-turbine blade application, DIA, 8/20, p. 84

53, 54. Plastics, Rubber & Elastomer

Plastics, M, 3/19, p. 111
 Wear behavior of plastics on plastics, A, 2/12, p. 79
 RECREATION EQUIPMENT: Stronger plastics for sports, A, 6/11, p. 84
 New family of flame-retardant engineering plastic, N/T, 6/25, p. 8
 New plastics bridge a gap, N/T, 6/25, p. 20
 New unreinforced nylon improves productivity, N/T, 10/22, p. 4
 Plastics for harsh environments, A, 11/12, p. 106
 Epoxy carried in pocket-size spool, F&J, 11/19, p. 4
 Carbon fibers boost strength of SMC moldings, A, 3/26, p. 112
 Lightweight lightpole cuts installation time, S, 4/9, p. 76
 Reinforced plastic forms lightweight doors, S, 4/23, p. 38
 Blast through tube actuates, detonates, or ignites, N/T, 5/7, p. 8
 Molded-in strings form tough racket, S, 9/10, p. 54

55, 56. Joining Materials, Other Nonmetals

Sealant protects car tires from punctures, N/T, 3/12, p. 18
 Adhesives hold heliostats together, S, 5/7, p. 48
 Selecting structural adhesives, A, 5/21, p. 67
 'Ancient' sealant looking good for modern-aircraft fuel tanks, N/T, 10/22, p. 12
 Adhesives, F&J, 11/19, p. 147
 Strengthening soldered connections, A, 9/10, p. 148
 Other engineering materials, M, 3/19, p. 247
 Theory of solids structure holds promise, N/T, 12/10, p. 10
 Graphite-composite beam will self-deploy in space, DIA, 4/23, p. 68
 Ceramic engine parts on the way?, MD, 6/18, p. 5
 Quartz mesh promising in space antenna, N/T, 7/9, p. 10
 Airy glass promises better-insulated windows, N/T, 9/10, p. 12
 RECREATION EQUIPMENT: On the water, A,

57. Finishes, Coatings & Lubricants

Multilayer coating combines aluminum and epoxy, S, 8/6, p. 48
 Coatings that take a beating, A, 8/20, p. 71
 Saving energy with synthetic lubricants, A, 6/11, p. 142
 Lubricating with oil-filled 'plastic sponges', A, 9/24, p. 108

58. Prefabricated Forms

Designing wire-cloth parts, A, 8/6, p. 133
 Strength of perforated metals, A, 8/20, p. 108
 Heat pipes reduce honeycomb stresses, S, 9/10, p. 48
 Aluminum body panels looking good, N/T, 2/12, p. 12
 Calculating sheet-metal allowances, A, 2/26, p. 121
 Cutting costs with prefinished steel bar, A, 3/26, p. 83
 CONSTRUCTION EQUIPMENT: At the cutting edge, A, 5/7, p. 72
 Bimetal strips follow the sun, S, 11/12, p. 54
 Static protection for electronic components, A, 3/26, p. 97
 Reflecting layers trim insulation weight, S, 6/25, p. 38



6 MANUFACTURING PROCESSES

61, 62, 63. Metal Casting, Shaping, Forming

Thumbnail guide to nonferrous metalworking, A,

7/23, p. 77
 Process turns out iron castings inexpensively, N/T, 4/23, p. 8
 New process for casting aluminum and other alloys, N/T, 10/8, p. 18
 Close-tolerance, no-flash forgings, A, 5/7, p. 99
 Focus on forging, A, 9/10, p. 131

Regional densification forms finished races, S, 2/26, p. 50
 Tips for specifying cold-drawn steel shapes, A, 4/23, p. 84
 Calculating flat pattern shapes, A, 5/7, p. 130
 Spacing of metal stampings, A, 10/22, p. 118
 Shifting rollers keep steel strip flat, DIA, 1/8, p. 130

64, 65. Metal Joining, Removal

Stitch folding joins metal and/or plastic sheets, N/T, 10/22, p. 8
 Welding processes, F&J, 11/19, p. 166
 Resistance welder joins graphite-fiber composites, S, 2/12, p. 44
 Impact welds created by pulsed magnetic field, N/T, 7/9, p. 12
 Brazing processes, F&J, 11/19, p. 163
 Soldering processes, F&J, 11/19, p. 158
 Machine tools on the move: Making chips fly, A, 3/12, p. 69

66. Metal Treating

Galvanizing process reduces spangle pattern, N/T, 3/26, p. 10
 The promise of cryogenic processing, A, 1/22, p. 73
 Ionitriding to case harden transmission gears for big vehicles, N/T, 4/23, p. 16
 Photo chemical machining of gears, A, 3/12, p. 107
 Healing defects by HIP, A, 5/21, p. 79

67, 68. Finishing, Plastics & Rubber Processes

Electropolishing goes functional, A, 9/24, p. 56
 Understanding plasma-sprayed coatings, A, 3/12, p. 91
 'Perfect' metal mirrors produced for laser-fusion system by diamond micromachining, N/T, 9/24, p. 12
 Lost-wax technique puts holes in plastic, S, 1/8, p. 48
 High technology comes to injection molding, A, 2/26, p. 103
 Lost-metal technique forms molded racquet, S, 3/26, p. 38
 A plastic molding process for 'impossible' parts, A, 4/9, p. 183
 Controlling the cost of rubber parts, A, 5/21, p. 100
 Rapid growth reported for RTM process, N/T, 7/9, p. 10
 Triple extrusion forms integral storm-door seal, S, 6/25, p. 38
 GM giving away molded-coating process, N/T, 2/12, p. 16
 Induction welding joins plastic valve, S, 11/12, p. 50

Ion beam improves adhesive bonds, A, 11/12, p. 136
 Joining plastic, F&J, 11/19, p. 152

69. Production Machinery & Plant Equipment

Fastener preload, F&J, 11/19, p. 61
 Automatic assembly, F&J, 11/19, p. 63
 Injected-metal assembly, F&J, 11/19, p. 172
 Pulse-combustion gas furnace promises impressive energy savings, DIA, 1/22, p. 66
 Solvent pen provides pinpoint cleaning, S, 1/22, p. 33
 Long-barreled screw gun speeds stress-plate installation, S, 2/12, p. 42
 Grity bit makes clean holes in rubber, S, 4/9, p. 76
 Serrated wrench removes smooth fasteners, S, 5/7, p. 50
 Welding torch cleans itself, S, 7/9, p. 46
 Hot roller fixes faulty foils, S, 9/24, p. 45
 Preload tool cuts torque-wrench requirements, S, 1/22, p. 30
CONSTRUCTION EQUIPMENT: Easy on operators, A, 5/7, p. 74

**7 DESIGN THEORY AND TECHNIQUES****71, 72, 73. Design Analysis & Basic Science**

Shake-tests for electronic assemblies, A, 1/22, p. 93
 Adding ribs for maximum strength, A, 2/26, p. 113
 A practical guide to bolt analysis, A, 4/9, p. 225
 Tightening threaded fasteners, A, 4/9, p. 240
 Basic course in finite-element analysis: Basic concepts, A, 6/25, p. 103
 Basic course in finite-element analysis: Modeling, A, 7/9, p. 153
 Stabilized bearings with finite-element analysis, A, 7/9, p. 169
 Basic course in finite-element analysis: Advanced

techniques, A, 7/23, p. 97
 A 'road map' for stress analysis, A, 8/6, p. 139
 Analyzing noise with finite elements, A, 8/6, p. 148
 Thermal stresses in spherical shells, A, 10/22, p. 111
 Color tips off stress on finite-element display, N/T, 11/12, p. 12
 Minimizing stress with photoelasticity, A, 12/10, p. 125
 Calculating properties for solids of revolution, A, 12/10, p. 184
 Simplifying velocity analysis for mechanisms, A, 6/11, p. 123
 Quick way to shape flat patterns, A, 10/8, p. 183
 Calc program finds gas pressure drop, A, 1/8, p. 162
 Liquid ohms simplify gas-flow calculations, A, 10/8, p. 178

The Engineering Model: for scaled-down problem solving, A, 10/22, p. 60

74. Human Factors

Applying human factors in design, A, 4/9, p. 243

76. Metrication

Developing a plan for metric conversion, A, 10/22, p. 116

**8 ENGINEERING MANAGEMENT AND OPERATION****81. Engineering Department Operations**

How to keep product costs in line, A, 1/22, p. 50
 Estimating the cost of uncertainty, A, 9/24, p. 106
 Speeding up an engineering project, A, 1/22, p. 104
 Building designed to boost engineers' productivity, N/T, 11/26, p. 2
 Salvaging the sub-par performer, A, 12/10, p. 117
 Controlling engineer supply, A, 6/11, p. 29
 Moving toward a service economy, N/T, 7/23, p. 25
 How to succeed as a manager: Part 1—The manager's role, A, 3/26, p. 76
 How to succeed as a manager: Part 2—The causes and prevention of failure, A, 4/9, p. 217
 How to succeed as a manager: Part 3—Why the switch from engineer to manager is difficult, A, 5/7, p. 91
 How to succeed as a manager: Part 4—Taking charge of your career, A, 5/21, p. 59
 How to succeed as a manager: Part 5—Easing the transition to management, A, 6/11, p. 89
 How to succeed as a manager: Part 6—Should you get an M.B.A. degree? A, 6/25, p. 59
 How to succeed as a manager: Part 7—Where the technical supervisor fits in, A, 7/23, p. 63
 How to succeed as a manager: Part 8—The uses of organization, A, 8/6, p. 117
 How to succeed as a manager: Part 9—Organizing the technical operation, A, 9/10, p. 95
 How to succeed as a manager: Part 10—Planning: the path to better results, A, 9/24, p. 63

How to succeed as a manager: Part 11—The art of decision-making, A, 10/8, p. 111
 How to succeed as a manager: Part 12—Controls for technical operations, A, 10/22, p. 69
 How to succeed as a manager: Part 13—Evaluating technical performance, A, 11/12, p. 79
 Salary prospects bright for engineers, A, 1/8, p. 25
 Engineer salary profile, N/T, 4/9, p. 28
 Breaking the \$35k barrier, A, 8/20, p. 56
 \$ Surveys: Compare with caution, A, 10/22, p. 24
 How to use time more effectively, A, 12/10, p. 178

82, 83. Product Planning, Drafting & Reproduction

Marketing as a design partner, A, 4/23, p. 51
 Plotting part intersections, A, 1/8, p. 164
 Color photos replace engineering drawings, N/T, 1/22, p. 18
 The image makers: How the latest in photo-reproduction can simplify your paperwork, A, 11/26, p. 69

85. Technical Information

Coming: accurate phase diagrams that industry can

get at, N/T, 11/12, p. 18
 Technology for sale: Screening the buyers, A, 3/26, p. 60
 Negotiating an invention agreement, A, 4/23, p. 86
 Quality of the indoor environment, N/T, 9/24, p. 18

87. Personal & Professional

U. S. 1981 R&D funding to reach \$68.6 billion, N/T, 1/22, p. 16
 Streamlining your workload, A, 1/8, p. 105
 Maximizing your potential for creativity—Part 1, A, 2/12, p. 93
 Maximizing your potential for creativity—Part 2, A, 2/26, p. 81
 Encouraging invention, A, 6/25, p. 111
 Electro/81 in New York, April 7-9, N/T, 3/12, p. 28
 Wescon in San Francisco, September 15-17, N/T, 8/20, p. 25
 Student designers attack prison costs, N/T, 6/11, p. 20
 36th SPI RP/C Conference, Feb. 16-20, N/T, 1/22, p. 12
 Student boom causes mixed reactions, A, 5/21, p. 20
 Enlarging the engineer's outlook, A, 7/9, p. 113
 Whistle-blowing: The perils of professional dissent, A, 3/12, p. 83



9 MISCELLANEOUS

91. Complete Machines

The great escape: Better looms are designer's goal, N/T, 11/26, p. 20
Testing started in M-X missile program, N/T, 1/8, p. 4
New Maverick to boost Navy's firepower, N/T, 1/22, p. 10
ALCM models tested on proposed aircraft, N/T, 2/26, p. 8
IUS readied for space, N/T, 2/26, p. 22
F-16 to get Norwegian missile, N/T, 5/21, p. 16
Pneumatic valve is key to missile-flight control, DIA, 6/25, p. 60
6-mm handguns for the U.S. military, N/T, 7/23, p. 4
Vasp's millimeter-wave 'eye' takes first look for armor, N/T, 8/6, p. 4
MX transporter to be less expensive than expected, N/T, 8/6, p. 8
Night and smoke can't hide targets from IR Maverick, N/T, 9/24, p. 4
Rocket launcher delivers low-cost payload, DIA, 9/24, p. 84
M-X missile models 'flown' in wind tunnel, N/T, 10/8, p. 8
Galileo nose-tip candidate tested in a hyperballistics range, N/T, 11/26, p. 8
Super M60 tank made from conversion kit, DIA, 11/26, p. 78
Materials 'secrets' succumbing to 'cannon fire', N/T, 12/10, p. 8
DEFENSE R&D: Faster spinoff for industry, A, 12/10, p. 98
New retrieval equipment for space shuttle's boosters, N/T, 3/12, p. 16
Machine tools on the move, A, 3/12, p. 68
Machine tools on the move: Watch out for Britain, A, 3/12, p. 77
MX gains momentum, A, 4/9, p. 38
GM bets heavily on the J-car, N/T, 4/9, p. 56
CONSTRUCTION EQUIPMENT: New push for productivity, A, 5/7, p. 46
CONSTRUCTION EQUIPMENT: Equipment that builds itself, A, 5/7, p. 75

Mobile-crane sheds 70,000 lb, DIA, 5/7, p. 106
Under-sea guy lines steady offshore oil platform, DIA, 5/21, p. 72
Reversed vending machine encourages aluminum conservation, DIA, 7/9, p. 128
Coming: improved residential fire sprinklers, N/T, 7/23, p. 12
Lock-on tracks get aircraft over soft ground, N/T, 8/20, p. 8
Flat dredge head cuts cleaner channels, DIA, 8/20, p. 86
AGRICULTURAL EQUIPMENT: The race for innovation, A, 9/10, p. 82
Backhoe bucket cuts pipeline costs, S, 11/12, p. 48
Robot welders key to K-car quality, F&J, 11/19, p. 2
Business gets its own communications-satellite system, N/T, 1/8, p. 10
Flexible legs secure deep-sea oil rig, DIA, 3/26, p. 90
HOME APPLIANCES: Serving the fast-food generation, A, 8/6, p. 84
Check-out station has built-in bag maker, DIA, 8/6, p. 110
Build your own satellite receiver, N/T, 9/10, p. 10
Detroit engineers a comeback, A, 1/8, p. 96
Fuel-efficient business aircraft makes first flight, N/T, 2/12, p. 8
Ducted-fan trainer duplicates jet's behavior, DIA, 2/12, p. 88
Jupiter spacecraft outgrowth of Venus technology, N/T, 2/26, p. 4
A second chance for blimps, N/T, 3/26, p. 25
Air inlets 'tuned' on new export fighter, N/T, 4/9, p. 8
Countdown to the orbital express, N/T, 4/9, p. 48
New submersible to take good look at deep-ocean floor, N/T, 5/7, p. 8
FAA certificate received by Loughhorn 55, N/T, 5/7, p. 12
INDY on a shoestring, A, 5/7, p. 26
Hornet survives weather assault, N/T, 5/21, p. 4
Composite wings log outstanding flight performance, N/T, 5/21, p. 16
Air cushion platforms to launch fighters from battle-weary runways, N/T, 6/11, p. 4
Low-profile tow truck manipulates jumbo jets, S, 6/11, p. 50
Orbiting station proposed as base camp in space, N/T, 6/25, p. 4
Future-aircraft designers see big changes inside, N/T, 7/9, p. 4
Shuttle opens door to profits in space, A, 7/9, p. 100
Around the world in 20 days is balloon designer's goal, DIA, 7/23, p. 70
Ford adds Lincoln Continental to '82 luxury lineup, N/T, 8/20, p. 4
Don't research solar power from satellites, N/T, 8/20, p. 12
Mobile homes in your neighborhood? N/T, 8/20, p. 18
Pathfinder shipped in rehearsal of first IUS delivery, N/T, 9/10, p. 20
Flight 2: Shuttle ready for encore, A, 9/24, p. 24
Chopper design is simpler with tail rotor gone, DIA, 9/24, p. 82
Design activity peaks in auto industry, N/T, 10/8, p. 29
Commuter Cub: New mini economy car, N/T, 10/22, p. 12
Hornet approved as fighter, N/T, 11/12, p. 2
GM unveils new front-drive A-cars, N/T, 12/10, p. 23
Cockpit of the future, A, 12/10, p. 31
Metro bus design goes back to basics, DIA, 12/10, p. 142
Monkeys trained to aid handicapped people, N/T, 4/9, p. 18
CAT scans: a new NDT tool for industry, A, 6/11, p. 37
Rocker crutch conserves energy, S, 9/10, p. 51
Fluid power for the body, FP, 9/17, p. 3
Space telescope will see farther with precision mirror, DIA, 11/26, p. 80
Rekindling an interest in wood, A, 1/22, p. 44
Bike bars flip for touring, S, 3/26, p. 40
Mechanical-bull market is bullish, N/T, 5/21, p. 26
RECREATION EQUIPMENT: Tryout for new technology, A, 6/11, p. 76
Interlocking box keeps bike tools in place, S, 8/6, p. 51
Life goes on in sealed bottles, N/T, 12/10, p. 12

CLASSIFICATION SYSTEM

1 ELECTRICAL AND ELECTRONIC

11 Motors and electromechanical actuators
12 Motor controls and protectors
13 Switches and relays
14 Circuit components
15 Miscellaneous components
16 Interconnections
17 Control systems and computers
18 Power supplies, conditioners and controls
19 Instrumentation

2 FLUID POWER

21 Fluids
22 Fluid conditioners
23 Fluid conductors
24 Linear devices
25 Rotary devices
26 Seals
27 Valves
28 Instruments and controls

29 Systems and assemblies

3 MECHANICAL

31 Power sources
32 Constant-speed drives and transmissions
33 Adjustable-speed drives and transmissions
34 Drive components
35 Rotational components
36 Mechanisms
37 Controls
38 Subsystems

4 ASSEMBLY COMPONENTS

41 Fasteners
42 Spring and isolation devices
43 Miscellaneous
44 Measurement equipment

5 MATERIALS

51 Ferrous metals

52 Nonferrous metals
53 Plastics
54 Rubber and elastomer
55 Joining materials
56 Other nonmetals
57 Finishes, coatings and lubricants
58 Prefabricated forms

6 MANUFACTURING PROCESSES

61 Metal casting
62 Metal shaping
63 Metal forming
64 Metal joining
65 Metal removal
66 Metal treating
67 Finishing
68 Plastics and rubber processes
69 Production machinery and plant equipment

7 DESIGN THEORY AND TECHNIQUES

71 Design analysis
72 Applied mathematics
73 Basic science
74 Human factors
75 Legal and environmental
76 Metrication

8 ENGINEERING MANAGEMENT AND OPERATION

81 Engineering department operations
82 Product planning and marketing
83 Drafting and reproduction
84 Laboratory and testing
85 Technical information
86 Personal and professional
88 Outside services

9 MISCELLANEOUS

91 Complete machines
99 Unclassified

The following organization is authorized to microfilm all of our publications and to supply copies of individual articles, pages or entire issues.

UNIVERSITY MICROFILMS, a Xerox Company, 300 North Zeeb Road, Ann Arbor, Michigan 48106, telephone: (313) 761-4700.

Your order to UM should include this required information:

Periodical Title: _____

Title of article: _____ Author: _____

Date of issue: _____ Volume No.: _____

Inclusive pages to be copied: _____ thru _____

Number of copies of article needed: _____

The standard fee for one copy of a complete article, or portion of the article is \$10.00, including postage. Additional copies of the same article are \$1.50 each.

Full remittance must accompany this order.

